Final Project

**In this project, you will collect your own data, conduct exploratory data analysis, develop hypotheses, and then create data visualizations to answer the hypotheses. The project tasks are list as follows:**

Tasks

1. Collect a set of data, which you will create data visualizations for. Based on your needs, you may process the data such as clean it or filter some data items out before you use it. Transform the data into one or multiple CSV files. Describe the data files including its content and attributes so that others can understand the data without referring to any other materials.
2. Conduct an exploratory data analysis (EDA) of the data and develop at least three hypotheses that you would like to answer. Based on EDA results, explain why you think the data set is sufficient to answer the hypotheses. You may create some data visualizations to answer the question.
3. Create a group of data visualizations (at least three graphs) to answer the hypotheses. The data visualizations must include at least 2 interaction features. Explain how the data visualizations answer the hypotheses. Explain the development of the data visualization: you need explain why do you choose the elementary perceptual tasks, the visualization formats such as scatter plots or bar charts. Explain the rationales for choosing the 2 dimensional space design, the spatial layout, the colors, etc.
4. Write a report that includes the description and explanation of your project development and all data visualizations. You may create the data visualizations using any tools, and then copy the graphs into the report. Convert your report into one PDF file that includes everything except the CSV data file. The paper should include content that is typical of papers that appear at IEEE Visualization, SIGGRAPH, or CHI. In particular it should contain:
   1. Introduction - An explanation of the problem and the motivation for solving it.
   2. Related Work - A description of previous papers related to your project.
   3. Methods - A detailed explanation of the techniques and algorithms you used to solve the problem.
   4. Results - The visualizations your system produces and data to help evaluate your approach. For example, you may include running times, or the time users typically spend generating a visualization using your system.
   5. Discussion - What has the audience learned about visualization from your work?
   6. Future Work - A description of how your system could be extended.
5. Submit your report, code, PDF and CSV files.
6. 5 points for presentation, please records a 5-10 minutes video presentation of your project using screen recording software, and then upload the video to Youtube , then submit the Youtube public link on Canvas discussion board. The presentation session will give you a chance to show off the hard work you put into your project, and to learn about the projects of your peers. You should include a demo of your project along with the poster. The final presentation should include the following information:
   1. Problem: A clear statement of the problem your project addresses.
   2. Motivation: An explanation of why the problem is interesting and what makes it difficult to solve.
   3. Approach: A description of the techniques or algorithms you used to solve the problem.
   4. Results: Screenshots and a working demo of the system you built.
   5. Future Work: An explanation of how the work could be extended.

Prior to starting your project, it is helpful to gain a sense of what goes into formulating a successful visualization project. We encourage you to read the following guidelines for writing visualization research papers. It is an enjoyable read and should help you avoid common pitfalls, even if you do not have a research focus:

\*[Process and Pitfalls in Writing Information Visualization Research Papers](http://www.cs.ubc.ca/labs/imager/tr/2008/pitfalls/pitfalls.pdf), by Tamara Munzner.

## Suggested Project Topics

[Edward Tufte’s](http://edwardtufte.com/) site is a place to look for project ideas. His question/answer area is full of ideas that would make good class projects. If you are interested in conducting human subject experiments, Stephen Few has put together a [collection of possible questions to explore](http://www.perceptualedge.com/blog/?p=2258).

Several previous visualization courses have had project components. Browsing through the final reports may help you think about what you might like to do. These descriptions may also help you determine the realistic size and scope of a project.

* Edward Tufte’s site (<https://www.edwardtufte.com/tufte/>)
* Stephen Few (<http://www.perceptualedge.com/blog/?p=2258>)
* [UBC Information Visualization (Tamara Munzner)](http://www.cs.ubc.ca/~tmm/courses/547-14/)

## Bonus Points:

2 bonus points to generate your visualization using custom code(Python/R/PowerBI self-developed custom visual….)

Reference: This assignment is created based on online document at:

https://magrawala.github.io/cs448b-fa17/